1 Introduction

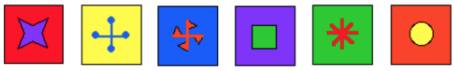
3-dimensional objects are not always easy to visualize. That's why we can use nets to represent them, in a 2-dimensional way. A **net** is a pattern you can cut out and fold to make a model of a solid shape. All convex 3-dimensional objects have their own nets.

2 Warm Up

1. How many faces does a cube have?
2. How many edges does a cube have?
3. How many vertices (corners) does a cube have?
4. How many edges are connected at a vertex? Is the answer the same for all vertices?
5. How many faces have a common edge? Is the answer the same for all edges?
6. To make a 3-inch by 3-inch cube, how many smaller cubes that are 1-inch by 1-inch do we need? Draw this below.

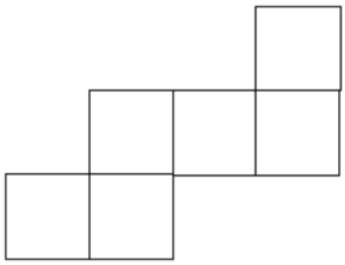
3 Fun Problems

1. Here are the six faces of a cube. They are in no order



Here are three views of the cube, from different angles.

Can you figure out where the faces are in relation to each other and map them on this net of the cube?

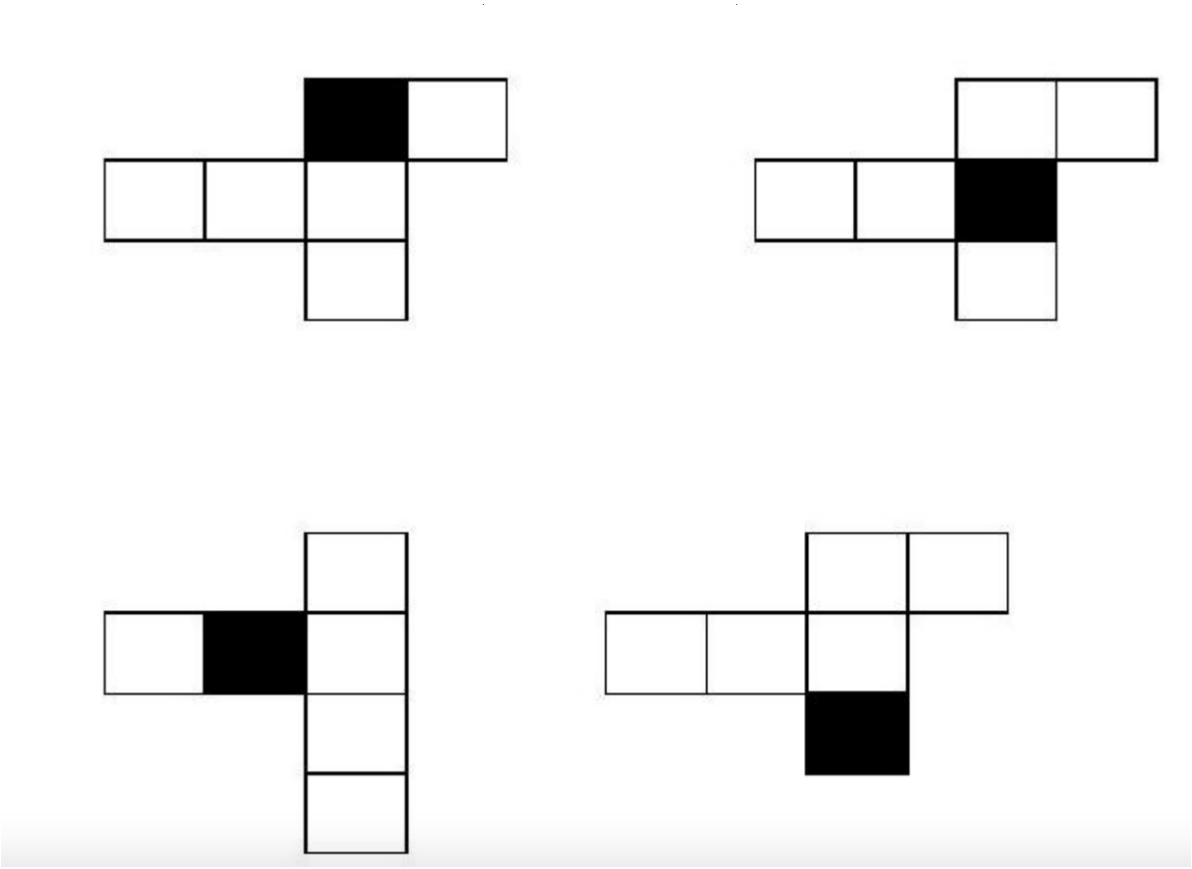


2. Challenge: Suppose you have a cube of side length 3. You cut off one inch from each corner, leaving behind a new figure. How many sides does this new figure have? Can you think of a name for it?

3. Draw a net for this new object.

4 More Nets!

On the nets of the cube below, one of the faces is shaded. Shade the opposite face. Also remember to label each of the faces (U, D, L, R, F, B).



5 Challenge

Bobby has a cube with side length of 4 cm.

1. Bobby cuts this cube into smaller cubes, each with a side length of 1 cm. How many cubes does he have?
2. Bobby takes another cube of side length 4 cm, and cuts this cube into smaller cubes, each with a side length of 2 cm. How many cubes does he have now?
3. Compare your answer from part (a) to your answer from part (b). Which is greater?
4. What can you say about the relationship between the size of the cubes Bobby cuts and the number of cubes he cuts?